Ordering number : EN5701

Monolithic Linear IC

LA4582CM

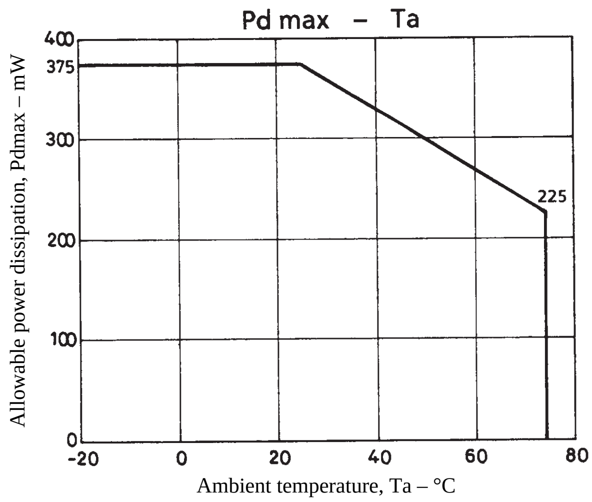
Pre + Power Amplifier for 3-V Headphone Stereo Systems

Overview

The LA4582CM is a preamplifier plus power amplifier IC that support auto-reverse, and was developed for 3-V headphone stereo systems.

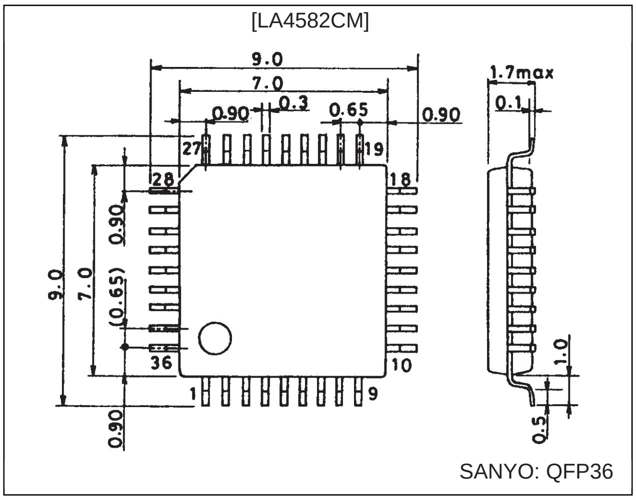
Features

- The LA4582CM was developed for cassette playback systems, and in addition to preamplifier and power amplifier functions, it also provides low boost and automatic power limitation (PVSS: Peak Volume Select System) functions.
- Provided in a 36-pin miniature flat package (0.65 mm lead pitch) that is optimal for set miniaturization.
- Capable of driving 8-Ω speakers
- Two-channel playback auto-reverse preamplifier
- Two-channel headphone power amplifier
- Low-frequency boost function (auto-loudness effect)
- Output suppression function (PVSS)
- Two-channel radio input switch (pre-mute switch)
- Power mute switch



Package Dimension

unit: mm



Specifications

Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max		4.5	V
Allowable power dissipation	Pd max		375	mW
Operating temperature	Topr		–20 to +75	°C
Storage temperature	Tstg		–40 to +150	°C

Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V_{CC}		3.0	V
Operating voltage range	V_{CC} op		1.8 to 3.6	V

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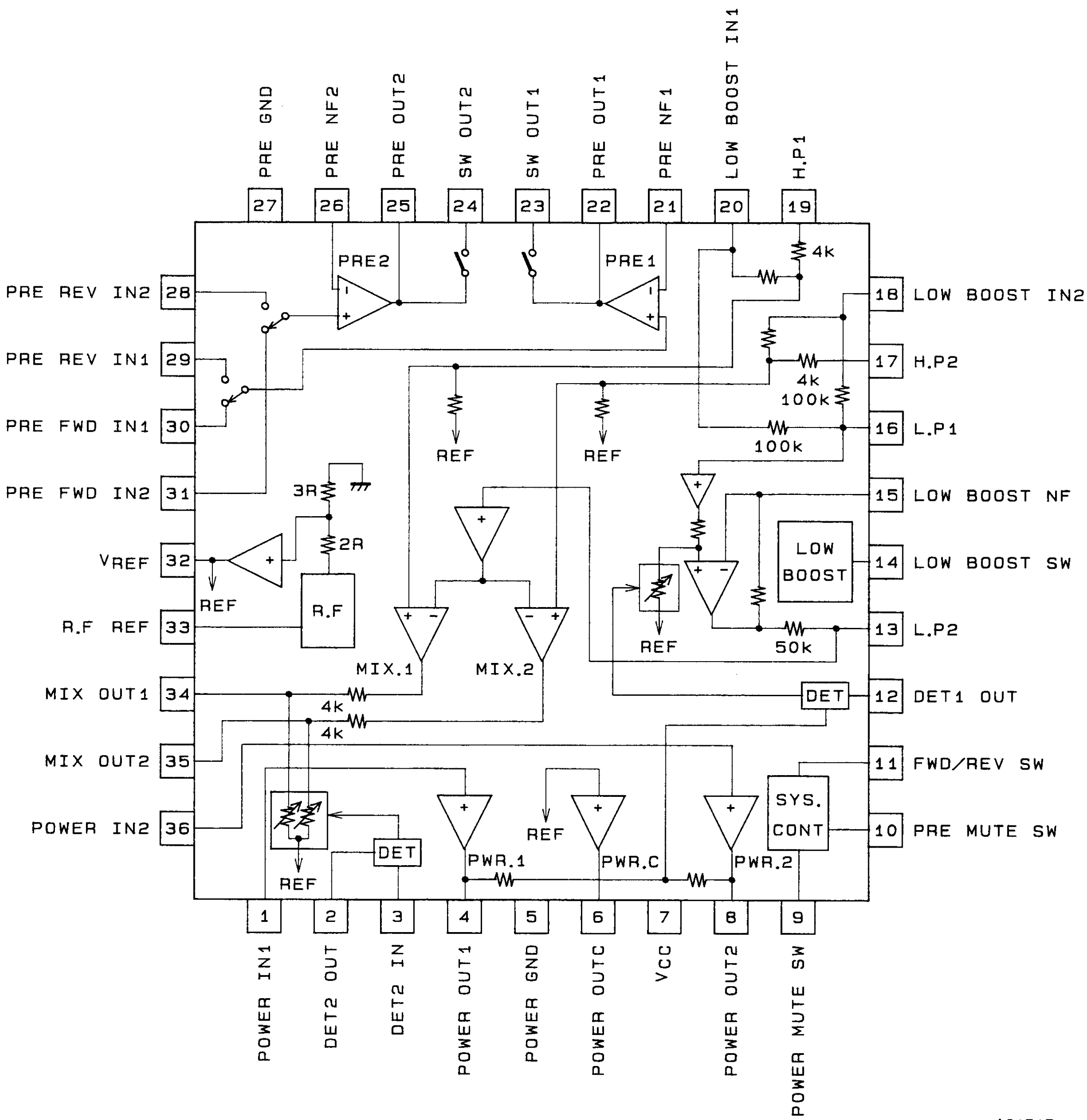
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Operating Characteristics at Ta = 25°C, V_{CC} = 3.0 V, fi = 1 kHz, 0.775 V = 0 dBm R_L = 10 kΩ (preamplifier), R_L = 30 kΩ (low boost), R_L = 16 Ω (power amplifier)

Parameter	Symbol	Conditions	Ratings min	Ratings typ	Ratings max	Unit
[PRE + L.BOOST + PVSS + POWER]						
Quiescent current	$I_{CCO}1$	Rg = 2.2 kΩ, low boost off, PVSS off	13	19	29	mA
	$I_{CCO}2$	Rg = 2.2 kΩ, low boost on, PVSS on	14	20	30	mA
Voltage gain (closed loop)	VG_T	V_O = –5 dBm	62.5	64.5	67.5	dB
[Preamplifier]						
Voltage gain (open loop)	VG_0	V_O = –5 dBm	70	83		dB
Voltage gain (closed loop)	VG_1	V_O = –5 dBm		40		dB
Maximum output voltage	V_O max1	THD = 1%, V_{CC} = 1.8 V	0.1	0.2		V
Total harmonic distortion	THD_1	V_O = 0.2 V, VG = 40 dB/NAB		0.05	0.5	%
Equivalent input noise voltage	V_{NI}	Rg = 2.2 kΩ, BPF = 20 Hz to 20 kHz		1.3	2.0	µV
Crosstalk	CT_1	Rg = 2.2 kΩ, TUNE 1 kHz	60	80		dB
Ripple rejection	Rr_1	Rg = 2.2 kΩ, V_{CC} = 1.8 V, Vr = –20 dBm, fr = 100 Hz	40	50		dB
[Power Amplifier]						
Output power	P_O	THD = 10%	23	34		mW
Voltage gain (closed loop)	VG_2	V_O = –5 dBm	27	29	32	dB
Total harmonic distortion	THD_2	P_O = 1 mW		0.4	1.0	%
Interchannel crosstalk	CT_2	V_O = –5 dBm, R_V = 0 Ω	30	40		dB
Output noise voltage	V_{NO1}	R_V = 0 Ω, BPF = 20 Hz to 20 kHz		25	40	µV
Ripple rejection	Rr_2	R_V = 0 Ω, V_r = –20 dBm fr = 100 Hz, V_{CC} = 1.8 V	45	55		dB
Input resistance	Ri		22	30	38	kΩ
DC offset voltage	$V_{ODC\ OFF}$	Between pin 8 and pins 4 to 6	–90		+90	mV
[L· BOOST]						
Voltage gain	VG_3	V_{IN} = –30 dBm, boost: on/off	–2.3	–3.8	–5.3	dB
Boost	BST_1	V_{INBST} = –30 dBm, f = 100 Hz, boost: on	11.2	14.7	18.2	dB
	BST_2	V_{INBST} = –30 dBm, f = 10 Hz, boost: on	7.0	8.5	10	dB
Maximum output voltage	V_O max2	THD = 1%, boost: on	0.3	0.5		V
Total harmonic distortion	THD_3	V_O = 0.1 V, boost: on		0.04	0.5	%
Interchannel crosstalk	CT_3	V_O = –20 dBm, Rg = 0, boost: on	25	32		dB
Output noise voltage	V_{NO2}	Rg = 0, BPF = 20 Hz to 20 kHz, boost: off		2.0	5.0	µV
Ripple rejection	Rr3	Rg = 0, f_R = 100 Hz, V_R = –20 dBm, V_{CC} = 1.8 V, boost: on	45	53		dB
[L· BOOST + PVSS + POWER] R_V = 30 kΩ max						
Voltage gain	VG_4	V_{IN} = –40 dBm, f = 1 kHz, boost: on/off	22.0	24.5	28.0	dB
Low boost output voltage	V_O1	V_{IN} = –43 dBm, f = 100 Hz, boost: on	0.13	0.23	0.33	V
	V_O2	V_{IN} = –28 dBm, f = 100 Hz, boost: on	0.25	0.4	0.55	V
Low boost total harmonic distortion	THD_4	V_{IN} = –40 dBm, f = 100 Hz, boost: on		0.5	1.2	%
PVSS voltage	V_O3	V_{IN} = –40 dBm, PVSS2	–40	–37	–34	dBm
PVSS width	W_{PVSS}	Input increment between the point where operation starts and the point where the output is +4 dB from there. PVSS: on	30	40		dB
PVSS total harmonic distortion	THD_5	V_{IN} = –40 dBm, PVSS2		0.5	1.2	%
PVSS start input	V_{OPIN}	PVSS2	–67	–63	–59	dBm

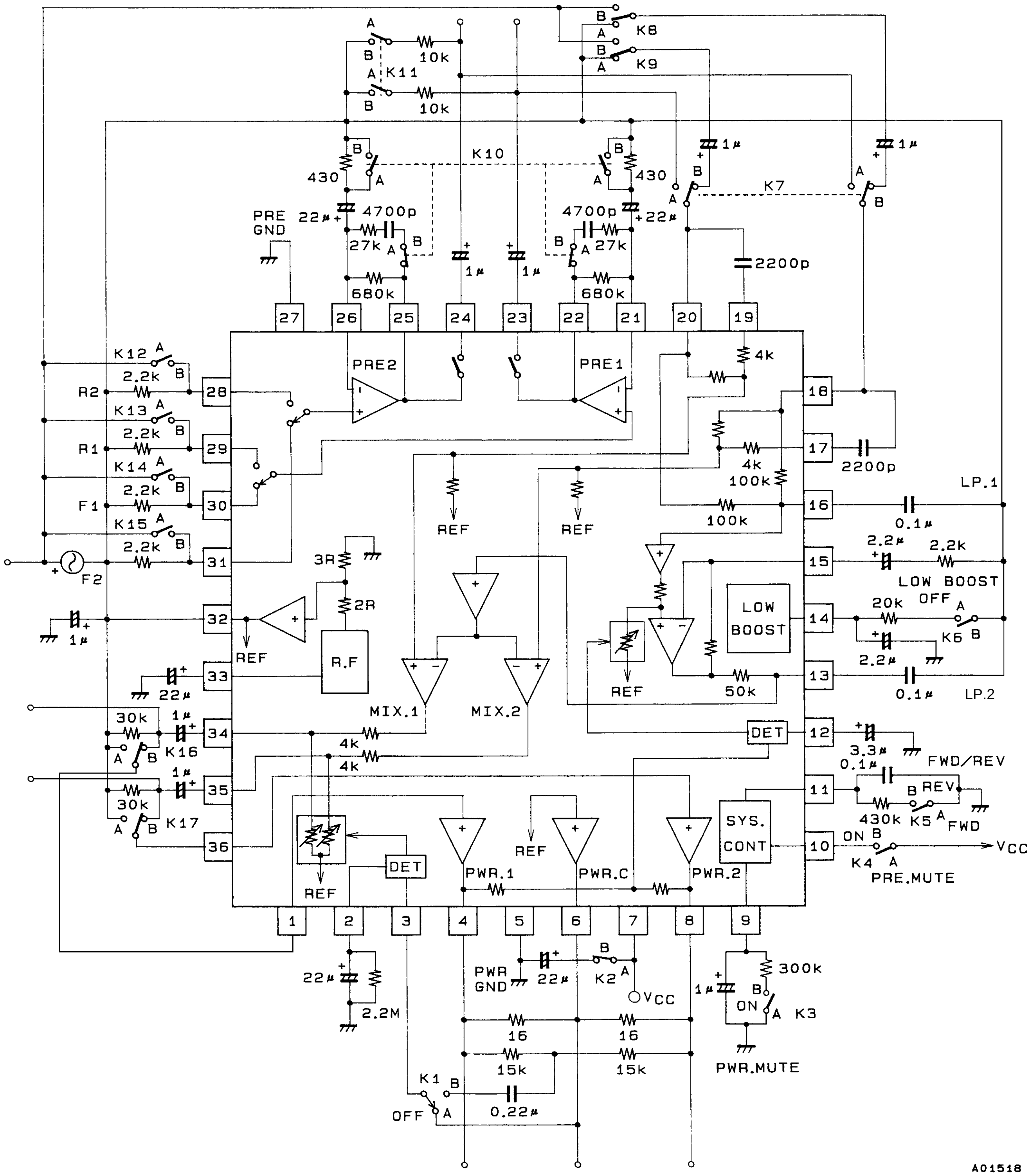
Note: The amount of boost for a 1-kHz signal.

Block Diagram



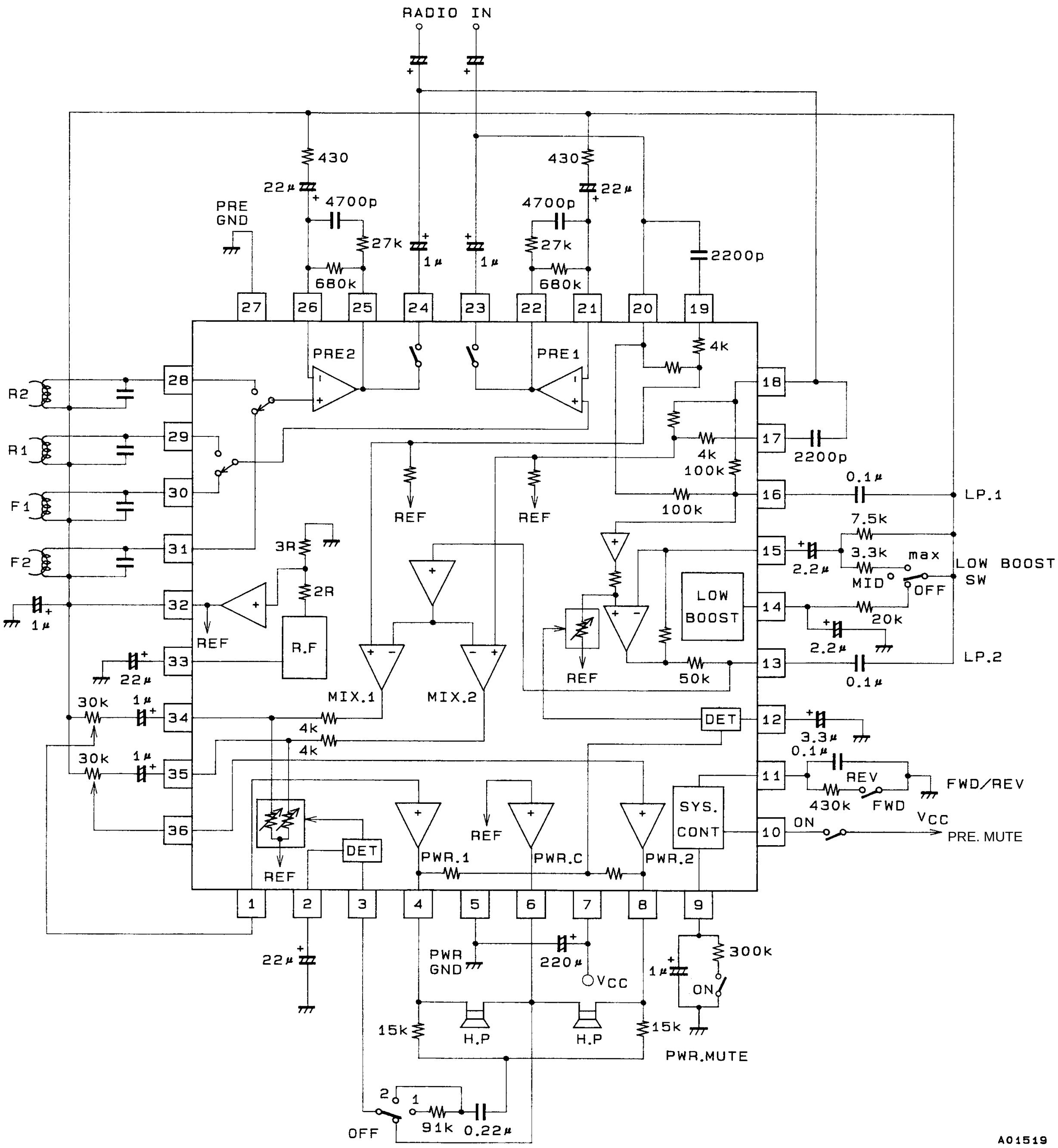
Unit (Resistance: Ω)

Test Circuit



Unit (Resistance: Ω, Capacitance: F)

Sample Application Circuit



Unit (Resistance: Ω, Capacitance: F)